

USAWC STRATEGY RESEARCH PROJECT

WATER WARS: THE NEED FOR A NATIONAL WATER POLICY

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ABSTRACT

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Conflict, unlike any we've seen before, may soon be facing our nation. The availability of clean water equates directly to survival, growth, and prosperity. Human population growth and development, as well as environmental considerations, place ever increasing demands on water. America's lack of a national water policy is already beginning to reveal the underlying tensions, fears, and anxiety that exist in various parts of our country. At least, three states are currently in a heated debate over the allocation and use of water in their region. The U.S. Army Corps of Engineers manages several fresh water reservoirs across the country. The Corps often finds itself in the middle of such disputes over the supply, use, and allocation of this essential national resource. Competing demands for drinking water, ecosystem sustainability, hydropower, and recreation present difficult challenges to the Corps and our Nation. A national water policy will alleviate some of these tensions and provide for a more efficient and effective method of managing this critical resource across the nation.

WATER WARS: THE NEED FOR A NATIONAL WATER POLICY

If the wars of this century were fought over oil, the wars of the next century will be fought over water.

—Ismail Serageldin
Vice President of the World Bank, 1995

Vital to Life and Prosperity

Mankind is blessed to live in a world of diverse natural resources. These resources vary widely in both type and abundance; from gold and diamonds; to forests, lakes, and rivers; to oil and natural gas; to a variety of metals and mineral deposits. The world's resources support man's livelihood, cultural traditions, and quality of life. However, water possesses a unique characteristic that sets it apart from all others. Freshwater is the building block of life. It circulates throughout living things, transporting nutrients to our organs, facilitating the chemical reactions that drive life's functions, and removing waste materials.¹ It is the primary substance in the human body, making up 70-percent of our mass. A lack of water becomes immediately apparent to all of us. A 1-percent loss of water in our body triggers the thirst sensation. A 5-percent loss causes a fever, and a 10-percent loss makes us immobile. Death arrives with a 12-percent loss of water.² Water does not discriminate between young, old, rich, or poor. Simply put, no life is possible without water.

Many natural resource limitations can be mitigated through alternative resources. For example, oil is a key energy resource that is limited and non-renewable. The importance of oil is recognized around the world as a key component of economic vitality and progress. There exists alternative energy needs such as coal, wind, hydropower, and nuclear power that help to limit a dependence upon oil. However, unlike oil, water has no substitute. There are no synthetic waters or alternative means to sustain life's most basic necessity. It is for this obvious reason that the relative importance of water quickly rises to the top of individual and national priority lists when its supply and access is threatened.

The aspirations of human society expand the need for water beyond simple survival to comfort, convenience, enterprise, and even recreation. Access to water drives economic growth and prosperity. In the U.S. it takes 300 gallons of water to produce a single loaf of bread. A pound of beef requires 1000 gallons of water. Approximately, 100,000 gallons of water go into the manufacture of each automobile.³ The desire to achieve a higher standard of living places additional demands on the water supply.

Limited and Poorly Distributed

Freshwater is a renewable resource, but the volume of freshwater on the Earth's surface is finite. The world's total freshwater supply does not increase or decrease. The land receives as much water today as when the first civilizations emerged thousands of years ago.⁴ The continued supply of freshwater is made possible by the Earth's "water cycle".⁵ This natural process of purification and distribution occurs everyday. The water cycle is driven by energy from the sun which evaporates water from the oceans and land and transports it throughout the globe. More water evaporation from the oceans occurs than falls on them, thus there is a continuous transfer of freshwater from the oceans to the continents. Rainwater is captured by lakes, ponds, and wetlands which eventually release it back into circulation through evaporation, seepage into groundwater, and discharge into rivers. On an annual basis 505,000 cubic kilometers of water evaporates from the oceans. This is equivalent to the top 4 feet of the sea. Of this, approximately 10-percent falls as precipitation on land.⁶

From space, Earth looks like a giant blue marble filled with water. However, it is misleading to think that freshwater is in great abundance. While water covers 70-percent of the Earth's surface, approximately 97-percent of it is saltwater. Of the remaining 3-percent, more than two-thirds is locked up in glaciers, snow, ice, and permafrost.⁷ Of the freshwater that is technically available, only a small portion is found on the earth's surface (lakes, rivers, wetlands, soil, plants, and animals). Subtracting out soil moisture, seepage, water vapor, and groundwater only 0.0098-percent of the earth's total water is available as freshwater.⁸ Groundwater supplies account for approximately 0.06-percent of the earth's freshwater but half of this supply is at depths beyond one-half mile below the surface making it unfeasible to utilize. The small fraction of 1-percent of the earth's water must not only support the world's drinking water needs but also agricultural, industrial, navigation, and hydropower needs. This limited freshwater supply is also reduced due to human pollution and contamination.

One of nature's inequities is the distribution of freshwater over the Earth's surface. About three-fourths of all annual precipitation falls on areas that contain less than two-thirds of the world's population.⁹ Asia receives 36-percent of global runoff yet contains 60-percent of the world's population. In contrast, South America receives 26-percent of freshwater runoff to support only 6-percent of the world's population. The Amazon River alone carries 16-percent of the earth's rainwater runoff yet it is accessible to less than 1-percent of its population.¹⁰ The African continent is rather evenly balanced but suffers from great distribution disparities within the continent. For example, the Congo River and its tributaries account for 30-percent of runoff in Africa, yet it is home to only 10-percent of the African population.

The element of time also plays a significant factor in the availability of water for human use. Flooding sends about half of the annual freshwater supply unused to the sea.¹¹ Availability varies greatly from season to season and from year to year. The Ganges and Mekong have distinct dry season and wet seasons. Seasonal rains typify much of the developing world's freshwater supply. India receives 90-percent of its rainfall during the annual summer monsoon season. In many developing countries, they can only make use of 20-percent of available rainfall because it arrives in storms and floods.

Population growth within the next 50 years will have dramatic impacts to the world's water supply. The world's current population (6 billion) is growing at a rate of 80 million people per year.¹² Water withdrawals in developing countries are increasing at a rate of 4 to 8-percent per year.¹³ Populations are growing bigger and thirstier. Currently, 0.5 billion people live in countries that are chronically short of water. This is expected to increase eight fold by 2050 to 4 billion.¹⁴ There is clearly an emerging gap between those that have adequate access to water and those that struggle to meet life's basic water needs.

Of the small percentage of available groundwater, current rates of withdrawal are unsustainable. Groundwater renewal rates vary, but residence time in deep aquifers is typically measured in hundreds, thousands, and even hundreds of thousands of years. This water is often called "fossil water" not only because it has been in the ground for millennia but also because once it is removed it will not be renewed over any relevant time scale.¹⁵ Although people have been withdrawing groundwater since the earliest civilizations, within the past 50 years the rate of withdrawal has increased dramatically. In some cases, so much water has been withdrawn from aquifers that saltwater has started to infiltrate into the water table turning it brackish and unusable. In Mexico City, the emptying of aquifers has caused the city center to subside by 7 meters since 1950. In Pakistan and North China the water table drops by over 3 meters per year. In El Paso, the water table supporting more than 1.5 million people is expected to be depleted within 30 years.¹⁶ The aquifers are not bottomless and are seldom a source of sustainable freshwater supply.

Ever since Aristotle discovered that "vapor produced from seawater, when condensed, is no longer salty", thoughts of the sea becoming a source of drinking water source have endured.¹⁷ However, the popular belief that saltwater desalinization is the cure-all for the world's freshwater challenges remains more of an ideal than a reality. On average, seawater contains 3.5-percent salt. The threshold for typical municipal drinking water standards is less than 0.05-percent salt.¹⁸ Although desalinization is a proven technology, its usefulness is outweighed by the enormous costs involved. Desalinization currently accounts for less than

0.1-percent of total world water usage.¹⁹ Capital costs to build a sizeable desalinization plant, let alone operate one, is several millions of dollars. Saudi Arabia's Shoaiba desalinization plant was completed in 2003 at a total project cost of \$1.06 billion.²⁰ The cost of desalinated water is about \$2 to \$3 per cubic meter.²¹ This is 4 to 8 times the average cost of municipal water and 10 to 20 times typical agricultural water costs. It is estimated that a large scale reliance on desalinated water to replace current freshwater usage would approach \$3 trillion per year or roughly 12-percent of the 2004 gross world product.²² This basic cost estimate does not capture plant replacement costs or water "losses" necessary to sustain livestock, croplands, and other items to sustain human activity. Despite established desalination operations in parts of the world, it remains a highly expensive and energy intensive process. Saudi Arabia, United Arab Emirates, Kuwait, and Bahrain are some of the few countries utilizing desalinization extensively.²³ In a sense, these countries are turning oil into water and can afford to do so. In the foreseeable future, saltwater desalinization will likely remain an option reserved for wealthy nations and provide only a minor contribution to the world's total water supply.

Increasing Demand

Demands for freshwater have risen along with a steady rise in populations around the world. It took history up until 1830 to reach one billion people on Earth.²⁴ Yet, within the next 100 years, the world reached the two billion mark. Now, in less than another 100 years, the world has six billion people. This figure is expected to exceed eight billion by 2025.²⁵ The population levels are not limited to new births. Increased advances in medicine and healthcare are allowing more and more developed societies to live longer. Similar medical advances are reducing child mortality rates. This growth will directly challenge the world's available water supplies. By 2025, the number of countries unable to supply the minimum necessary (1,000 m³/year) water for an adequate quality of life in a moderately developed country will double to more than 30 countries.²⁶

Mother nature established the boundaries of river basins long before man established political boundaries. Water is without nationality. It acts and reacts according to the physical laws of nature as it moves with impunity from one political boundary to another. This occurs at the local level (personal property), the state level (provinces), and the international level (countries). Of the major rivers of the world, 261 transcend international boundaries.²⁷ These rivers carry 80-percent of the world's freshwater supply.²⁸ The Danube alone passes through 17 nations, the Nile passes through 10, and the Tigris-Euphrates/Shatt al Arab passes through

6.²⁹ This disparity between natural boundaries and political boundaries has helped to sow the seeds for conflict.

International Freshwater Conflict

Fighting over water resources is certainly not new. In ancient Mesopotamia, a “true water battle” occurred 4,500 years ago between the city-states of Umma and Lagash.³⁰ At issue were the irrigation rights along the Tigris River. A resource as vital as freshwater, compounded by rising demand has heightened tensions between those that control water and those that need it. The struggle over freshwater has a direct impact on security and stability. The Nile, the world’s longest river, meanders across half the length of the African continent. Egypt has depended upon the Nile for sustenance, irrigation, and navigation since the beginning of their society. It is no surprise then, that Egypt responded angrily to proposals to dam portions of the river upstream. Ethiopia, Sudan, and Uganda all have designs to build new dams on the Nile. These projects include hydroelectric plants and massive irrigation systems to divert water for the upstream nations. The previous president of Egypt, Anwar Sadat, warned that any upstream actions that would endanger “the waters of the Blue Nile...will lead to war”.³¹

Ethiopia’s goal for damming the Nile is understandable. For decades, it has restrained from such projects while watching the treasure of freshwater pass through its borders. Ethiopia is the source of 85-percent of the Nile’s water which it desperately needs to tap in order to feed its people.³² Egypt, meanwhile, irrigates millions of acres of farmland with Nile river flows.

Many historians have argued that the 1967 Israeli war was fought, in part, to secure water for its people.³³ During the war, Israel secured a vital aquifer that lies beneath the West Bank as well as the headwaters of the River Jordan.³⁴ Water disputes in the region continue to flare. Palestinians badly need more water, yet the Israelis have banned the Arabs from drilling new wells and have limited the Palestinian allocation of water to 1967 levels. Israel uses about 95-percent of the annual recharge of the aquifer.³⁵ Many of the Palestinian wells are drying up and are out of operation.

A 2001 Lebanese plan to withdraw water from the Hasbani river, a tributary to the River Jordan, has provoked Israel to threaten the destruction of the pumping station.³⁶ In 2006, Israel acted on its promise by bombing the pumping station during air-strikes against the Hezbollah.³⁷ Lebanon argues that the Israelis are using the war against Hezbollah to secure the flow of water.

Disputes over water in Central Asia is also becoming heated. The main sources of water, the Syr Darya and Amu Darya rivers, are controlled by Kyrgyzstan and Tajikistan. At issue is

Turkmenistan's, Uzbekistan's, and Kazakhstan's demand for more water for irrigation. After two consecutive dry seasons, Uzbekistan deployed an airborne assault unit in the vicinity of Kyrgyzstan's Toktogul hydropower station and held border exercises to rehearse the take over of a "well defended installation".³⁸ Ultimately, the issue was settled diplomatically, but the sensitivities are clear. Water disputes are serious business and such disputes are not limited to foreign countries. The United States has its own history of fighting over water.

U.S. Freshwater Conflict

The United States has a well documented history of water conflicts "out west". Ever since westward expansion, the Colorado River has been claimed, tamed, and diverted from its natural course. Californians have benefited the most. The states of Arizona, New Mexico, and Texas, let alone Mexico, have benefited the least. Perhaps what is little known is that America's domestic water conflict is not unique to the "dry states" of the west.

The Great Lakes, the world's largest supply of freshwater, has a history of heated disputes over usage and allocation. The Great Lakes basin is populated by over 33 million people, approximately 10-percent of the U.S. population and 25-percent of the Canadian population.³⁹ As the Great Lakes population continues to increase, so too will the demands on the region's freshwater supply. Due to increased consumption and below average rainfall, the water levels of lakes Huron and Michigan have dropped 21 inches below the seasonal average.⁴⁰

The perceived abundance of Great Lakes water has lead to water diversions to the Mississippi river during periods of drought. Canadians have repeatedly objected to proposals to increase diversions from Lake Michigan to the Mississippi. The International Joint Commission (IJC) is a Canadian and U.S. agency that has overseen boundary water issues since 1909 with the signing of the U.S.–Canada Boundary Water Treaty. The treaty was designed to regulate the shared use of Great Lakes water. However, a legal loophole exists in that Lake Michigan, contained entirely within the U.S., is exempt. Lake Michigan diversions are now limited by a 1980 U.S. Supreme Court decree to 2.1 billion gallons per day.⁴¹

Nations around the world have begun to realize that Canada and the US are sitting on a liquid gold mine. In 1998, the Ontario-based Nova Group received a permit to withdraw up to 790 million gallons of Lake Superior water.⁴² The intent of Nova Group was to ship the water by tanker to thirsty customers in Asia. Tanker shipments of large volumes of water is well established in the Middle East and islands of the south pacific.⁴³ Strong opposition to the Great Lakes water venture by both Canada and the U.S. forced the withdrawal of the permit.⁴⁴

However, fears about setting a precedent for the authorized sale of water to other nations is a major concern.

If one Asian shipper and one Canadian water retailer believe it is economically feasible to ship Great Lakes water to Asia, the door is open to putting the waters of all the Great Lakes on the market. US Rep. Bart Stupak (D) of Michigan⁴⁵

The IJC found itself ill-prepared for the issue of Great Lakes water exports. The commission urged both governments to place a temporary moratorium on bulk water sales and to adopt stringent requirements for large-scale water exports with the intent that such requirements would be virtually impossible to meet.⁴⁶

The lure of Great Lakes freshwater extends to America's Midwest and southeast. The cities of Akron Ohio, Lowell Indiana, Kenosha Wisconsin have all unsuccessfully sought Great Lakes water.⁴⁷ Concerns about declining soil moisture content in the Corn Belt has also energized interest in irrigation projects utilizing Great Lakes water. Fearful of a "raid" on Great Lakes water, the governors of six states and Quebec's Minister of International Relations signed an agreement to protect Great Lakes water from literally going south. Governor James Thompson of Illinois expressed concern that the southern states will "snatch our last remaining prize".⁴⁸

Fears aside, there is no doubt that southern states are struggling to satisfy their own demand for water. The tri-state dispute among Alabama, Georgia, and Florida over waters of the Alabama-Coosa-Talapoosa (ACT) and Apalachicola-Chattahoochee-Flint (ACF) river basins highlights the challenges facing southeastern states. The region has been traditionally described as "water rich" with Georgia being one of the wettest hydrological states.⁴⁹ The headwaters of both the ACT and ACF river basins originate in north Georgia. The demands of agriculture, industry, and the environment; combined with rapid population growth, has the region at an impasse over how to allocate this precious resource. Several formal and informal negotiations between the states have been contentious and have failed to produce amicable solutions. Plans by Georgia to build a new reservoir north of Atlanta, which would further restrict flows of the rivers, prompted Congressman Glen Bowder (D-AL) to comment: "This water thing has reached a boiling point. We're in a water war".⁵⁰

The rapidly expanding metro-Atlanta area is a key factor in the dispute over water allocation. Its growth has doubled in the last 25 years to over 5 million people.⁵¹ Atlanta currently consumes a half billion gallons of freshwater per day.⁵² At current consumption rates, it is estimated that Atlanta will run out of water by the year 2030.⁵³

More water for Atlanta means less water for downstream states. As a result, the states of Alabama and Florida filed lawsuits to prevent any diversions of water along the ACT and ACF water basins. Alabama's position is described by Mr. Walter Stevenson Jr. of the Alabama Department of Economic and Community Affairs.

We feel that Georgia has taken the position that it wants to grow at whatever levels it chooses, regardless of harm to Alabama and Florida. We're not trying to slow down their growth. We're just trying to ensure that Alabama has an equitable share of water for its own growth, and if giving us that share slows growth in Georgia, then that's a consequence.⁵⁴

Alabama wants to ensure freshwater supplies to support its future growth and industrial needs. Georgia has agreed to allow a continuous "minimum flow" of only half the amount desired by Alabama.⁵⁵ Alabama's urban populations are also growing, particularly in Birmingham, Montgomery, and Mobile which all depend upon ACT and ACF water.

Meanwhile, Florida relies heavily upon the ACF basin. ACF water supplies 90-percent of Florida's lucrative oyster industry within the Apalachicola Bay.⁵⁶ Florida's economy and environment are intimately linked, thus providing the state's motivation to secure necessary flows of ACF freshwater. Georgia is concerned that any concessions of ACT-ACF water to Alabama or Florida will inherently restrict the growth of metro Atlanta and thus hinder its future economic vitality and prosperity.

For the past 15 years, the ACT-ACF issue has both surged and languished in litigation within the courts system. Attempts by new state administrations have typically been met with initial hope and optimism only to be soured by lack of compromise and concession. No doubt, the stakes are high. An ill-thought out concession by one side could negatively impact a particular state for decades with profound consequences to its economy and the welfare of its people. So far, the three heads of state and their lawyers have yet to reach a solution. A higher authority is required to break the deadlock, find common ground, and ensure the fair and impartial distribution of freshwater to meet multiple and competing demands.

The Need for a U.S. Water Policy

While the alarms and indicators of a pending water crisis continue to sound, there is no national level policy making body with the responsibility and authority to address comprehensive solutions to the mounting water disputes in America. The issue of who should control our vital water resources has proven to be an elusive task to our nation's policy makers. As a result, unresolved disputes often end up in the courts system, producing lengthy, costly, and uncoordinated decisions by well-meaning, but ill informed, judges. Unfortunately, there has

never been a lead federal agency charged with establishing a comprehensive national water policy.⁵⁷

The water supply policy making responsibilities within the United States lie primarily with the states and local jurisdiction. At the federal level, the Bureau of Reclamation is involved with the construction and management of major water storage facilities in the West. The other federal agency involved in water-use policy is the United States Army Corps of Engineers (USACE). USACE primarily focuses on the construction of navigation and flood control projects throughout the country. Several acts of Congress have shaped the involvement of other agencies throughout the U.S. government in water use. The 1974 Safe Drinking Water Act and the 1977 Clean Water Act have affected how water can be accessed and utilized. The Safe Drinking Water act establishes guidelines and standards to help prevent contamination of groundwater supplies. Such acts, to include the 1973 Endangered Species Act, have impacted water distribution within the drainage basin. It is important to note that each of these laws is written with a different audience and purpose in mind. They arose during the era of increased national conscience of our environment and the need to protect the habitat that depends upon it. These laws do not provide for a comprehensive water allocation policy. As the demand and conflict over water use continues to rise, several agencies have advocated an increased role of the federal government in making water policy decisions. Part of the difficulty lies with our nation's history of water law.

The basis for the U.S. legal system is English common law. The riparian principle of ownership rights has its roots in this 18th century law. Under the modified riparian principle, people living next to a river could lay claim to the water but could not dam or divert the river for "artificial" purposes such as irrigation or power production.⁵⁸ This system is typically the foundation for water rights in the Eastern states. However, population growth, urbanization, modern agriculture, and industrial development have severely challenged this form of governance.

New York state's Palmer vs. Mulligan decision in 1805 overruled water restrictions.

The idea of property underwent a fundamental transformation – from a static agrarian conception entitling an owner to undisturbed enjoyment, to a dynamic, instrumental and more abstract view of property that emphasized the newly paramount virtues of productive use and enjoyment⁵⁹

The 1849 California Gold Rush underscores this new view of water rights. Miners fought over the right to lay claim to mine miles of streams. Ownership of adjacent land was no longer a requirement to water rights. An 1882 Colorado Supreme Court decision stated that riparian rights are no longer applicable in the state.⁶⁰ This new "Colorado Doctrine" became the legal

framework for water rights in other Western states. Basically, the tenant of prior appropriation was brought into favor whereby the first person to apply water to a beneficial use had the first right to the water. Thus the phrase “first in time, first in right” was codified and vigorously protected.⁶¹ A typical application of prior appropriation is a local water company that filed notice with the state water regulatory agency to withdraw water from a river to be sold and used for domestic purposes. Once the permit was issued, the water company has priority use of that water from the river. Needless to say, this creates some angst among other users who desire to use the same water from the river.

The rights of the federal government to “federal” water, puts federal agencies, like USACE, in the awkward position of managing water to meet federal laws at the expense of state interests. All too often the result is litigation by the states to protect their perceived right to water. The Corps is burdened with “hundreds of active cases” scattered throughout the nation’s courts system.⁶²

Federal Involvement in Water

At this point, it is important to highlight the fundamental tensions that exists within our nation’s unique governmental system. The founder’s of the constitution deliberately designed a form of governance that does not empower, but limits government. The government is intentionally decentralized and distributed across three branches: Executive, Legislative, and Judicial. At the core of our forefathers mind was a fundamental distrust of government. The dynamic tension that exists was viewed as healthy and essential to an enduring government that would best serve the people of a new nation. For over 200 years, it has proven to be successful.

From the earliest days, water has played a part in the development of relationships between different states and between the states and the federal government. In 1784, George Washington envisioned navigation up the Potomac River as far as Cumberland, Maryland. Ultimately, he envisioned the national benefits of connecting the Potomac to the Ohio River and to the western frontier. George Washington engaged the states of Virginia and Maryland and secured their mutual support and cooperation for such a plan. This effort led to the Mount Vernon Compact providing for free trade on the river and eventually all 13 states joined in the compact for a “uniform system....necessary to their common interest”.⁶³ This interstate cooperation regarding the waters of the Potomac helped to shape events at the Constitutional Convention a few years later.

Since the early days of our nation, the extent of involvement by the federal government in public works projects has swung back and forth like a pendulum. The role of the federal government has often been looked upon with suspicion and mistrust. It was the states that were viewed as having the rightful autonomy to decide matters of importance to their states. At times, limited federal government was the norm. During other times, particularly during lean economic periods, more federal involvement was in favor. At all times there exists a healthy skepticism and mistrust within the Congress as to the extent of executive branch power in making decisions impacting the States.

In 1808, the Secretary of the Treasury, Albert Gallatin, proposed a method of providing federal assistance to the states for projects that were deemed too costly to undertake at the state level. He introduced an enduring concept of “economic benefits to the nation” as a means to justify federal involvement in large projects. At the time, there were several skeptics as to the wise use of federal funds in this manner. However, the idea began to take hold after the Civil War when the people and Congress “opened up the federal treasury to hundreds of public works improvement projects”.⁶⁴

President Teddy Roosevelt supported “multi-purpose river development” designed to include water supply, navigation, irrigation, power, and flood control. The value of water was beginning to be fully realized in light of its various uses. This was the Progressive period of U.S. government whereby a balance was struck between public and private funding of projects. When Roosevelt perceived that too much of the funding burden fell upon the government, he vetoed five water projects signaling a twelve-year period of less government involvement in water resources.⁶⁵

Franklin D. Roosevelt reversed this trend with the promotion of large public works projects in his New Deal policy. One product of this large scale federal approach to managing the nation’s water was the creation of the Tennessee Valley Authority (TVA). TVA became a prototype of multi-purpose river basin management and remains in existence today.

Planners and politicians began to debate the appropriate role of the federal government in regional development. Many congressman and local officials began to object to “imposed solutions from Washington”.⁶⁶ FDR had envisioned the management of America’s river basins in a holistic manner. The National Resources Committee (NRC) was established to oversee this undertaking. However, the NRC’s powerful link to the President created political tensions with Congress.

Squabbles and disagreements on various projects, and Congress’s resentment with the NRC’s scrutiny of “pork barrel projects” came to a head in 1943. When the president vetoed the

Wilson-Copeland flood control bill, based upon the NRC's recommendation, Congress set upon terminating the agency. The NRC's termination was, in part, a general reaction against the "whole concept of centralized federal planning" in which water management played a factor.⁶⁷ The pendulum had swung back towards limited federal involvement in water projects.

The breakup of the NRC left the management of the nation's waterways to four agencies: the Bureau of Reclamation, the Federal Power Commission, the Soil Conservation Service, and the U.S. Army Corps of Engineers. For decades, there was very little coordination among the agencies. The primary agency involved with water resources was clearly the U.S. Army Corps of Engineers. The Flood Control Act of 1944 gave the Corps a lead role in developing and planning projects. However, ultimate decision making authority was reserved for Congress.

Twenty years later, the pendulum began to swing back towards more federal control with the establishment of the 1965 Water Resource Council. The whiz-kid era that held a belief that math and science could answer the nation's problems also entered water management. Harvard University professors Arthur Maass and Maynard Hufschmidt established the Harvard Water Program that developed new technologies to water resource planning.⁶⁸ Their work influenced an approach towards planning and design of river basins that ultimately led to the creation of the Water Resource Council (WRC). The WRC contained many similarities to the NRC of the 1940's. The organization continued to mature as a national body to regulate and control the nation's water resources. Over the next twenty years, the WRC acquired significant powers and control of decision making on matters affecting the states. In the 1980's, President Ronald Reagan abolished the WRC due, in part, to his desire to transfer several federal powers back to the states. The pendulum had once again swung back towards less federal involvement.

Soft and Hard Federal Approaches

This brief historical look at our nation's history of water management suggests two possible approaches for an enduring future National Water Policy. World history, as well as American history, indicates that water disputes will continue to present themselves. A national approach is necessary to fully manage water that lies across political boundaries. I suggest that there are two approaches to the involvement by the federal government.⁶⁹ There is a soft approach utilizing "carrots" or incentives combined with disincentives. There is also the hard approach characterized by top-down management and control. Although both approaches come from a national perspective, the difference is to what extent the federal government should control the nation's waters.

The advantages of the hard approach lie with a consolidated decision-making cycle producing more rapid results on the ground. This approach embraces the concept that with the lion's share of funds comes the predominance of decision-making authority. It is a top-down, centralized approach whereby the States' input is recognized but not necessarily fully respected. This approach will likely disenfranchise the States and sour the Congress. The consolidation of powers, within a single agency, has historically been viewed unfavorably by the legislative branch. Past examples indicate that the hard approach will often wear out its welcome at the state level. Too often, well meaning federal agencies with autonomous control will "morph" into domineering inflexible institutions that trample states' desires. In terms of water management, one size does not fit all. The hydrology, the politics, and the culture vary widely across the country. Such a hard approach will likely produce more litigation and further delay the resolution of water issues by the cumbersome courts system.

The advantages of the soft approach lie with the fundamental recognition of States rights, authority, and control of water issues. The primary incentive of the soft approach is the provision of federal funding for upwards of 75 percent of the project cost. This funding often equates to hundreds of millions of dollars. It stands to reason that a major disincentive is the lack of federal funds to accomplish what a separate party desires. The soft approach offers federal assistance within a set of guidelines, underscored by sound science, that promote interstate cooperation and agreement. This is not dissimilar to George Washington's efforts on the Potomac. A means of incentives and disincentives can help shape federal efforts. This allows the states full participation and "buy in" to cooperative solutions to water challenges within their basin. An inherent incentive in this approach is the likelihood of less litigation through the difficult work of achieving mutual understanding and agreement among all parties. Since state and local agreement is required, the soft approach may likely take longer to implement basin-wide solutions.

The Road Ahead

Upon reflection of our Nation's past federal involvement in water management, the role of the federal government can be both highly effective yet at the same time overbearing with respect to states interests. It seems that an enduring national water policy should pursue the soft approach. The benefits of mutual cooperation and respect among the states will be well worth the investment in time and energy to achieve agreement. Human nature and interaction among different partners takes time, understanding, and compromise by all involved. Only through the mutual recognition of the challenges ahead, combined with a helping hand from the

federal government, will a comprehensive and well-integrated water management solution be achieved.

The U.S. Army Corps of Engineers is postured to play a significant role in this regard. The Congress has the authority to authorize a new Water Resources Development Act (WRDA) that could incorporate the necessary incentives and disincentives, primarily the release of federal assistance dollars, that will help shape future interstate water management challenges. Due to the Corps' structure and organization along drainage basins, as opposed to political boundaries, it is well positioned to accomplish such a role. The Corps has a long history of inter-agency coordination with the Department of Interior, Department of Energy, Environmental Protection Agency, Bureau of Indian Affairs, and other agencies that also compliments its appropriateness to the role. The military chain of command, by tradition, rotates commanders every few years. This inherent construct of the military can play a huge advantage in forming the basis for unbiased decision-making. The routine rotation of military command billets will guard against human tendencies to become attached or emotionally invested in a particular outcome or solution. It maintains a freedom of perspective by which commanders can look objectively at issues. The military has traditionally been viewed as one of the top institutions that possess the public's trust and confidence. It is for these reasons that the Corps may be a viable asset to be employed effectively at implementing and guiding the enduring principals of fairness and honesty with respect to managing the nations' water resources.

Conclusion

Conflict over water use has existed since the dawn of civilization. Due to its vital importance and limited supply, man has historically fought to access and control it. Population growth and other factors continue to increase tensions over water. Although blessed with freshwater resources, Americans are not immune to the struggle over water. A national water policy has never been fully established in this country. The fundamental rights of states has always chafed at a nationwide solution to water usage. Attempts at federal control has ebbed and flowed throughout American history. Ultimately, our history and form of government point towards a soft approach of national water policy based upon mutual cooperation and compromise to achieve common goals. The potential for a new WRDA is an excellent tool to codify new national policy guidelines towards water management. The U.S. Army Corps of Engineers is well positioned to act as the nation's steward for water resource coordination, negotiation, and implementation of holistic basin-wide agreements among the states.

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